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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/470,265	12/22/1999	KARL M ROBINSON	303.455US3	5953
21186	7590	08/30/2005	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402-0938			TRAN, THIEN F	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 08/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/470,265

Applicant(s)

ROBINSON, KARL M

Examiner

Thien F. Tran

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19,20,53,79-87,98-102 and 104-125 is/are pending in the application.
- 4a) Of the above claim(s) 80,83,86,98-102,104-106 and 113-124 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19,20,53,79,81,82,84,85,87,108,110-112 and 125 is/are rejected.
- 7) ☒ Claim(s) 107 and 109 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of species 4 with claims 19-20, 53, 79, 81-82, 84-85, 87, 107-112 and 125 in the reply filed on 06/22/2005 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 53, 85, 87 and 111-112 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. A first capacitor electrode of a first metal material and an oxidized portion including a second metal material different from the first metal material is not disclosed in the elected species 4. Applicant is requested to point out exactly wherein the application with respect to species 4 that discloses a first capacitor electrode of a first metal material and an oxidized portion including a second metal material different from the first metal material. In fact, Figure 12A, 12B and in page 8, 4th paragraph disclose first, second and third metal layers 75, 85 and 95 are titanium, wherein the first metal layer 75 is a first capacitor electrode and the second metal layer 85 is also titanium that is not different from the first metal layer.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 125 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation of the conductive layer including an oxidized portion, wherein the oxidized portion of the conductive layer constituting the dielectric structure is confusing and therefore indefinite. It is noted that a conductive layer should not be considered and claimed as a dielectric. The oxidized portion is a dielectric layer functioning as an insulating layer separating the first capacitor plate and the second capacitor plate. In fact, the oxidized portion (80 or 90 shown in Figure 11A) is not a conductive layer as claimed. Applicant is requested to point out exactly wherein the description with respect to the elected species 4 that discloses the oxidized portion is a conductive layer or a part of a conductive layer. It is clear that the oxidized portion is a part of a dielectric structure as shown in elected species 4 of Figure 11A.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 19, 79, 81, 108 and 125 are rejected under 35 U.S.C. 102(b) as being anticipated by Suguro et al. (USPN 5,189,503).

Suguro et al. discloses the claimed capacitor (Fig. 7d) comprising a polysilicon film 43 characterized as a first conductive capacitor plate of a first material; a second conductive capacitor plate 51; a dielectric structure (45, 47, 49) interposed between said first and second conductive capacitor plates, wherein said dielectric structure includes a non-oxidized portion 45 and an oxidized portion 47, wherein the oxidized portion includes a second material of WO₂.

Regarding claims 79 and 85, the oxidized portion 47 is formed from tungsten.

Regarding claims 81 and 87, the second conductive capacitor plate 51 is formed of metal.

Regarding claims 108, the capacitor further comprises a diffusion barrier layer 45 of tungsten interposed between the first conductive capacitor plate 43 and the oxidized portion 47 of the dielectric structure.

Regarding claim 125, Suguro et al. disclose an apparatus comprising a first capacitor plate 43 of a first material (polysilicon); a second capacitor plate 51; and a dielectric structure interposed between the first and second capacitor plates, wherein the dielectric structure is an oxide 47 of a conductive layer having a second material (tungsten), wherein the oxidized portion 47 of the conductive layer constitutes the dielectric structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20, 82, 84 and 110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blodgett et al. (USPN 5,811,990) in view of Suguro et al. (USPN 5,189,503).

Blodgett et al. discloses a memory system 710 (Fig. 18) comprising a monolithic memory device 705 having dynamic random access memory device containing a capacitor; and a processor 710 used to generate external control signals which access the monolithic memory device 705 (col. 14, lines 10-15). Blodgett et al. does not explicitly disclose the capacitor comprising a first conductive capacitor plate, a second conductive capacitor plate, a metal oxide layer and a metal layer overlying the first conductive capacitor plate. Suguro et al. as described in details above discloses the capacitor as claimed. It would have been obvious to person having ordinary skill in the art at the time the invention was made to substitute the capacitor as taught by Suguro et al. for the capacitor in the memory system of Blodgett et al. in order to provide an improved capacitor with low current leakage. As a result, the modified Blodgett et al. provides a capacitor comprising a first conductive capacitor plate of a first material; a second conductive capacitor plate; and a dielectric structure interposed between the first and second conductive capacitor plates, wherein the dielectric structure includes a non-oxidized portion and an oxidized portion.

Regarding claim 82, the oxidized portion of the dielectric structure comprises tungsten.

Regarding claim 84, the second conductive capacitor plate is formed of metal.

Regarding claim 110, the capacitor further comprises a diffusion barrier layer 45 of tungsten interposed between the first conductive capacitor plate 43 and the oxidized portion 47 of the dielectric structure.

Claims 53, 85, 87 and 112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suguro et al. (US 5,189,503) in view of Radosevich et al. (US 5,576,240).

Suguro et al. as described above do not disclose the first capacitor electrode 43 formed of a first metal material. Radosevich et al. disclose capacitor 10 comprising a lower plate 14 formed of aluminum, copper, titanium or noble metals (col. 2, lines 63-66). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the first capacitor electrode 43 of aluminum instead of polysilicon as taught by Radosevich for aluminum provides high conductivity and low cost. Suguro in view of Radosevich teach a first capacitor electrode of a first metal material of aluminum and an oxidized portion 47 including a second metal material tungsten different from the first metal material.

Regarding claim 87, the second capacitor electrode 51 is formed of metal.

Regarding claim 112, the capacitor further comprises a diffusion barrier layer 45 of tungsten interposed between the first conductive capacitor plate 43 and the oxidized portion 47 of the dielectric structure.

Allowable Subject Matter

Claims 107, 109 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: prior art reference do not teach or render obvious the oxidized portion of the dielectric structure comprising titanium.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien F. Tran whose telephone number is (571) 272-1665. The examiner can normally be reached on 8:30AM - 5:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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August 25, 2005


THIEN TRAN
PRIMARY EXAMINER